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THE DISADVANTAGES OF BEING HUMAN

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MAN early came so habitually to regard himself as the crown of animate nature, "the masterwork, the end of all yet done" in Milton's words, that he long ago arrogated to himself the perfection of the gods and to-day ordinarily blinds himself to the natural imperfections of his body and the disadvantages of being human until his machinery is in such poor working condition that he has to go to the doctor's. Far back in the days of pre-history, some genius suggested that man was made in the image of god and from that time on, there has been a pride of birth on the part of man, reaching a climax with the Junkers of Prussia and their super-manhood.

From time to time, however, prophets and seers have abundantly appreciated the imperfections of humanity, as when the Psalmist exclaims in an outburst of pessimism: "I am a worm." The ministers of the Scotch church in the seventeenth century, says Metchnikoff, quoting Buckle, the historian of civilization, thought there was nothing more surprising than that the earth could contain itself in the presence of that horrid spectacle, man, and that it did not gape as in former times, to swallow him in the midst of his wickedness. Even in our own time, Mark Twain more than once bemoaned the fact that he was a man and that humanity had very little to be proud of. The consideration of the physical disadvantages of being human is no new theme, but in the flush of victory over the arrogant Huns under the leadership of would-be super-men, it may be especially salutary to attend to this subject for a short time in order that the pride of creation may the better appreciate how far short of the gods he falls. In spite of thankfulness for being fearfully and wonderfully made, there are, as I shall show, some respects in which we may indeed be in fear of our precarious machinery and stand in amazement at the maladjustments of our own bodies.

At the same time that I wish to point out especially the disadvantages of being human from the bodily standpoint, I would not leave the impression that man is nothing but a bundle of mistakes and a poorly built machine. In spite of obvious defects he is, like every living creature, closely adapted to his environment and must, within limits, constantly adjust himself to changes in the environment. The crawling *Amœba* no less than the Marathon runner and the calculating philosopher are from moment to moment adjusting their internal relations to external relations with wonderful nicety. The muscles of the Marathon runner are absorbing oxygen as well as fuels necessary for their explosive action in contracting. The brain of Newton in contemplation of the law of inverse squares is absorbing molecules from the blood and discharging different molecules which have been produced by the activity of the brain cells. The failure of the heat-regulating mechanism to keep the bodily temperature within a few degrees of 98.6° Fahrenheit, or to respond to the increased temperature of the bake shop or boiler room causes illness and possibly death. From certain points of view the human mechanism is marvellously adapted and warrants man's high regard for himself. But in no case is adaptation to environment absolutely perfect. The more closely an organism is investigated, the more apparent is it that there are present disharmonies and imperfections. Johannes Müller sixty-odd years ago showed that in spite of the perfection of the eye as an optical instrument, it is very imperfect in correcting aberration of light. An ordinary camera or microscope made with so little regard for optical axes and irregularities of curvature of lenses would be a most unsatisfactory instrument. Helmholtz, to whom we are indebted for so large a part of our knowledge of the optics of the eye, says: "Nature seems to have packed this organ with mistakes, as if for the avowed purpose of destroying any foundation for the theory that organs are adapted to their environment." And yet the eye does very well for most of us and we are thoroughly happy in the possession of this structure whose lenses are not exactly curved and centered!

Disharmonies abound in practically all forms of living things. Rudimentary structures, which have outlived their usefulness, occur in all higher animals and are constantly "getting in wrong" with things about them. But besides the rudimentary structures there are others which may be regarded as incipient structures which have not yet attained the size and complexity necessary for their perfect functioning. Besides imperfect structures, a great many animals exhibit instincts or reactions to stimuli which seem to go counter to the best interests of the individual and the race. Perverted tastes in man are no less destructive than some perverted reactions in animals. For instance, the moth flying into the candle flame represents a maladjustment of the moth's mechanism and its environment which results in the destruction of untold myriads of moths. The nervous mechanism of the moth in this case is as much out of correspondence with its environment as the broken shaft of an ocean liner which in its rotation beats a hole in the side of the hull.

It is hard to explain in most cases the origin of these disharmonies, although in general it may be said that they represent a failure on the part of all the organs of the body to keep pace with the changing environment, or of the several organs to keep pace with each other. Some organs seem to be less plastic than others; some, on the other hand, apparently get into the habit, so to speak, of changing too rapidly. To enter into a discussion of the causes of these maladjustments that are disadvantageous to the organism would take us too far afield into the fundamental problem of biology, the origin of variations. It is enough at present to remember that the survival of the fittest is in spite of these defects.

Many of the defects of the human body may be referred back from the mechanical point of view to the present habit of striding about on two legs, a habit of very recent phylogenetic development—a fact vouchsafed by the length of time the infant crawls on "all fours" and the slowness with which it assumes the bipedal method of locomotion and exhibits a fairly well adapted structure for the upright position. So late in phylogeny has this position been acquired that many parts of the body have not yet become perfectly fitted for this remarkable experiment. So closely adjusted to each other, however, are the different parts of the body that any change in one part almost always brings about a change in every other part. As we shall have occasion to show, the upright posture has affected directly the skeleton, the muscles, the blood vessels, the jaws and teeth, and probably indirectly other parts of the alimentary canal and the organs of respiration; while many students of human evolution regard the abnormal development of the intellect of man as a direct outcome of the upright position with the freeing of the hands to learn of the environment by handling and the elevation of the principal sense organs in order to give man a broader horizon.

Let us turn first to a consideration of some of the defects of the skeleton which are associated with the upright position. The ancestral foot of man was characterized by the slant of the sole in relation to the axis of the leg so that the sole could be applied more perfectly to the cylindrical trunk of the tree, to which primordial man was fairly well adapted. In order to bring about this position of the foot, the heel bone is skewed and set off slightly to one side in such a way that when the anthropoid ape of to-day attempts to walk on the ground, it is necessary for the sole of the foot to be turned toward the middle plane of the body with the heel bone brought beneath the axis of the leg and the weight of the body borne on the outer edge of the foot. Man's heel has moved over somewhat further toward the inner side of the foot in order to bring the sole squarely on the ground, but the parts have not become perfectly adapted to the new arrangement for there is still a little weakness that manifests itself as fallen arch in thousands of human beings. The weakness of the arch in great measure is due to the long stretch between the ball of the foot and the heel and an imperfect support of the arch on the inner margin of the foot, a defect which is remedied often by the surgeon in treating fallen arches by extending the heel of the shoe forward along the inner side of the instep and also by building up the inner side of the heel to throw the sole of the foot inward and shift the weight of the body more to the outer side of the foot.

Another defect of the skeleton occasioned by the upright position is in the pelvis, which is attached to the vertebral column and encircles the posterior end of the alimentary canal and genital ducts and affords attachment of the hind legs. In the quadrupeds this part of the skeleton serves almost entirely for the attachment of the hind legs and plays only a very secondary rôle in supporting the viscera which are suspended along the entire length of the body cavity by mesenteries. As soon as the trunk assumes an upright position, however, the weight of the viscera pulls toward the tail instead of toward the underside of the animal and the mesenteries afford a far less efficient support. To compensate for this, however, the pelvis changes its function somewhat, and consequently its form, and instead of serving simply as an attachment for the limbs to the vertebral column, it now becomes a basin to aid the mesenteries in supporting the viscera by a partial closing together posteriorly so that a comparatively small opening is allowed for the passage of the alimentary canal and the genital ducts, and a flaring outward at the anterior end. This is not inconvenient or harmful in the least in the male, but in the female it increases the difficulty of parturition seriously, especially among the white races which have somewhat larger heads and less compressible skulls at the time of birth. Complete support of viscera and sufficient passage for the fetus at birth are mutually opposed to each other with a consequent disharmony.

The upright position has brought about several disadvantageous maladjustments in the blood vessels. Unlike the quadrupeds, in which the axis of the body is carried habitually more nearly parallel with the ground, in man the axis is vertical so that the blood vessels especially of the lower part of the leg must support an unusually tall column of blood and thus be subjected to a relatively great pressure. This pressure is borne by the arteries as well as by the veins, but the strong muscular walls of the arteries are easily able to withstand the strain of the weight of blood lying above them and the thinner walls of the deep-seated veins supported by the surrounding muscles are not likely to give way. But in addition to the deep-seated veins there are several superficial veins which lie beneath the skin only and so are deprived of the added support of the surrounding muscles. The walls of these vessels frequently give way, particularly in those who stand for long periods and whose blood vessels may be slightly weak. When these vessels rupture under the pressure of the blood, varicose veins result which have discommoded thousands upon thousands of human beings. The offending blood vessels may be supported by bandages, or in extreme cases they are generally removed by the surgeon and the blood which ordinarily passed through them finds its way through other vessels which gradually enlarge to accommodate the increased blood flow thrown upon them with no apparent inconvenience.

The veins of man exhibit further lack of adaptation to the upright position by the arrangement of the valves. These valves, which are pockets to prevent the blood from flowing away from the heart, are obviously important only in those veins which have a vertical course and in which the blood flows upward to reach the heart. Thus, the valves are found for the most part in the veins of the fore and hind limbs and in the intercostal veins. Were the valves thoroughly adapted to the upright position they would be quite differently distributed. There would be none in the veins between the ribs which have a nearly horizontal position in man and there would be an abundance of them in the large vessels entering the heart from the abdominal region. The great vein which receives blood from the legs and kidneys and the great vein which brings blood from the stomach and intestines are both without valves so that the circulation in the lower extremities and the abdominal organs is retarded and the pressure on the veins of the legs is sometimes seriously increased. Furthermore, congestion of the abdominal organs, especially the liver in which the circulation of the blood is at best sluggish, is frequent in the human race, a condition which would be improved if there were valves in the veins leading from the different organs which would relieve the tendency to back pressure and consequent retardation of the circulation.

The absence of valves in the great abdominal veins works hardship in another way. In case the extensive vessels of the alimentary canal suddenly enlarge as they do under the stimulus of a blow on the solar plexus, the blood is drained rapidly from the brain and the recipient of the body blow falls in a faint. With valves in the veins of the trunk to prevent the back flow of blood, the vessels of the brain would not be drained so rapidly and the insensibility would not follow such temporary derangements of the abdominal circulation.

The straightening up of the body involves the extension of the trunk on the thigh which exposes certain vessels dangerously. This condition is met with in no other vertebrate, and consequently is one of the most highly specialized conditions in the human body. Whereas in a dog or other quadruped, the groin is deeply seated between the thigh and the abdominal wall, in man it is fully exposed and unprotected. Just below the groin on the front of the thigh, a little toward the median side, is the superficial femoral artery, which is one of the principál channels by which blood is carried to the leg. In an animal with the thigh habitually bent on the trunk, this superficial vessel lies deep in the crease between thigh and trunk, securely protected from tooth and talon of the aggressor. But not so in man. With the feet spread in order to give him a broader base and a more secure balance, the femoral artery lies exposed in a most dangerous way, ready to be torn open by talon or spear. The genital organs are also dangerously exposed in upright man while in the quadrupeds they are fairly secure against frontal attack.

Not the least of the disadvantages of the upright position is the exposure of the entire abdominal wall to injury. As if it were not enough to expose to teeth and talons a large area which is unprotected by skeleton, the whole trunk is flattened and broadened so that a larger target for the attacker is afforded and some vulnerable points are dangerously exposed. It is hardly necessary to call attention to the solar plexus which is but poorly protected behind only a moderate rampart of viscera and which must in the history of the human race have caused the downfall of many a fighter before the modern pugilist came to realize the importance of this weak point of human anatomy. In this connection, too, it is interesting to note that some of the most skilful pugilists assume a crouching position in the prize ring which incidentally protects the defenseless abdomen more perfectly and presents a more formidable rampart to the enemy.

Turning aside from some of the defects which are the immediate outcome of the upright position we may turn for a moment to some defects which are not so closely connected with standing "upright, with the front serene."

The skin of man has lost certain structures which render it a less perfect hull for the internal organs than is the skin of many of the lower mammals. The coat of hair, so scanty over most of the surface, no longer affords a protection against cold or teeth and talons like the shaggy mane of the lion or the heavy pelt of the bears. In fact, the imperfect hair follicles of man are a positive disadvantage, for bacteria lodge in these tiny cups and often set up inflammation, giving rise to various eruptions of the skin. In the history of the race, thousands of men must have suffered untold annoyance from this cause and in many cases serious blood poisoning must have followed through the injury of these eruptions. The scanty coat of hair may have proven an advantage by affording poorer lodgings for fleas and other bodily vermin, but this advantage could hardly compensate for the exposure to cold and mechanical injury which a loss of hair involves.

Together with the loss of hair has also gone an extensive loss of dermal musculature by means of which the skin can be twitched, as is well seen in the horse when troubled with flies. This extensive layer of muscle has disappeared from the human species except on the front of the neck and the face and the scalp. Unlike the quadrupeds that can scare off insects without moving the limbs, man is under the painful necessity when disturbed by crawling insects of using a limb to chase off the offender like the proverbial Jerseyite in the mosquito season. It is conceivable that many of our forbears must have lost their balance in the tree tops in trying to drive off an insect with hand or foot. The advantage that would arise from being able to wriggle the skin independently of the limbs and thus overcome the irritation of tickling insects is obvious.

The skin muscles in man, as already said, are limited to the front of the neck and the head. By means of them mankind is as well as some of the apes, able to express various emotions. We draw down the corners of the mouth to express sadness and wrinkle the forehead in perplexity, and draw the corners of the mouth upward to indicate hilarity of spirit; but these functions are decidedly secondary in importance to the scaring off of insects.

There are rudimentary muscles attached to the external ear which are entirely comparable to those by which the ear of the grazing animals particularly is directed toward the source of the sound and by virtue of which the acuteness of the hearing is increased considerably, a fact borne out by the practise of those whose hearing is defective of holding the hand to the ear and making a kind of funnel with the large end toward the source of the sound. The loss of mobility of the ears has probably not been compensated.

The defects of the eyes as optical instruments have already been alluded to. But the defects here are as nothing in comparison with those of the neighboring organ of smell. So imperfect is the sense of smell in man that it is only by courtesy that we may be said to have such a sense. We recognize pleasant and disagreeable odors, if they are sufficiently concentrated, together with flavors, which we refer quite generally to the sense of taste; but the delicate odors that are appreciated by many of the lower animals are totally beyond our powers. To the dog with its sense of smell a whole world of sense impressions of which we know absolutely nothing is open. The human subject is generally unable to appreciate the difference in odor of the secretions of the skin under different strong emotions although there is abundant evidence that the nature of these secretions is modified by emotions. On one occasion I was greatly terrified at the sight of my small child calmly sitting on the edge of a roof upon which she had climbed, and, although I had just returned from my bath, I was conscious of a most fetid odor from my skin immediately after I had rescued the child—the odor of fear. With a sense of smell acute enough to perceive the passing variations in our bodily secretions would our knowledge of mankind who come in contact with us not be vastly increased? Sherlock Holmes equipped with a sense of smell keen enough to differentiate between the odor of sanctity and deceit would have made the feats of Conan Doyle's hero pale into insignificance! Primitive man might have escaped many an enemy by perceiving the odor of the skulking stranger suffering from the necessity of concealing his identity, and fearing discovery.

Nor is it alone in the function of the organ of smell that man is defective. The structure of that organ is rudimentary as might be expected and like all such structures is liable to great variation in form and to various diseased conditions. The sensitive organ of smell is spread out over a most complexly folded scroll of bone in the nose so that there is little chance for any fraction of the air drawn over it to fail to come in contact with the sensitive membrane. But these turbinal bones in the human subject are greatly reduced in size in comparison with our more sharp scented animal cousins and are often so deformed as to make little pockets in which the secretions of the nose accumulate and undergo decomposition. The disinfecting of the nose and the removing of these troublesome pockets in which mucus accumulates is an important work of the nose specialist. And this is largely due to the rudimentary condition of this sense organ whose function we of polite society are all too prone to taboo.

Before leaving the organs which cooperate in the function of respiration, it is of interest to note a trivial defect in the lungs which may have been the cause of countless deaths in the past and which seems to indicate a failure on the part of the body to be perfectly fitted for its environment. As is well known, the trachea passes from the mouth, or more properly the pharynx, to the lungs, dividing into the two bronchial tubes. The right bronchus is given off from the trachea at more nearly a right angle than is the left so that mucus rolling downwards, or disease germs carried down by the air current, find their way into the left lung with greater frequency than into the right lung. Correlated with this difference in the form of the two bronchi is the occurrence of pneumonia infections. In the typical case of lobular pneumonia, the congested areas cluster around the extremity of the left bronchus more closely than the right in exactly the fashion that would be expected when it is remembered that the germs of pneumonia do not have the power of independent locomotion but are wafted whither the wind listeth and multiply wherever they find a favorable environment.

The respiratory organs have suffered directly as a result of the upright position of man, for the emancipation of the forelimb from supporting the weight of the front part of the body has brought about a great change in the movements of respiration which have not been accompanied by perfectly adapted changes in the lungs. The anthropoid apes in captivity and man are very prone to tuberculosis of the lungs which gains a foothold generally in the more poorly ventilated parts of the lungs, the apices. In the respiratory movements of the anthropoid apes and man the diaphragm plays a very important part in enlarging the capacity of the thoracic cavity. By its contraction, the convex, domelike diaphragm is flattened and the length of the chest is thereby increased. But in addition to the diaphragm are the intercostal muscles and certain auxiliary muscles of respiration which extend from the shoulder blade to the ribs and from the arm to the ribs, the serratus and pectoral muscles principally. With the arms free, these last named muscles, which are very strong, in contracting draw the shoulder blade ventrally to increase the reach, as for example in striking a blow with the fist. With the arms free, the ribs serve as the fixed point of attachment and the shoulder blade is the movable portion of the mechanism. In the quadrupeds the relative importance of the movements of the diaphragm and the external muscles of respiration is almost reversed. In the quadrupeds bearing a part of their weight on the forelimbs, the arm becomes fixed and a contraction of the serratus muscle results in a raising of the ribs and consequent enlarging of the cross section of the chest. The gymnast swinging from horizontal bar or trapeze fixates his arms so that these muscles in contracting pull up the ribs and ventilate the apices of the lungs particularly well. On the same principle, in some diseased conditions in which shortness of breath is experienced, the patient finds it necessary to rest his hands on the back of a chair or other support in order to get his breath. But in so doing he is virtually becoming quadrupedal, at least to the extent that his arms become fixed and the strong external muscles of respiration aid in the elevation of the ribs in a way which is impossible where the arms swing freely.

The liberation of the forelimb from the work of supporting the body weight has been responsible further for several changes in the front part of the digestive system which are not unmixed joys although our ideas of human beauty are curiously enough closely bound up with them. The hands have become prehensile organs and the earlier prehensile function of the jaws has been lost and the jaws have shortened. By becoming a hand feeder, man's teeth have grown smaller and more closely crowded together. The teeth no longer have the important function which they once had, for the incisors are aided by the bare hands or knives and the grinders are rendered less important by pestle and grinding mill. The wisdom teeth show several unmistakable signs of degenerating. They are smaller than the molar teeth immediately in front of them, they are frequently imperfectly cut, and the cusps and cavities of the grinding surfaces fit with their opponents less perfectly than in the teeth in front. In fact the wisdom teeth fail to be cut in about ten per cent. of adult human beings. With the imperfect functioning of the wisdom teeth is a great tendency to decay, and on account of the delicacy of the membrane about their roots which is not stimulated as that around more frequently used teeth, infections and abcesses are much more common.

Even the milk teeth of children are weakened and become liable to decay in a way which indicates that they are far from well adapted to their purpose. How far the feeding of gruels and other foods offering little resistance to the teeth in chewing plays a part in inducing or facilitating decay, it is hard to say, but examination of the skulls of children of primitive peoples as late as the beginning of the Christian era shows that it is only very recently that the milk teeth have fallen so far short of expectations.

Even more rapidly than the disappearance of the teeth has been the shortening of the jaws which has brought about a condition giving much work to modern dentists. The shortening of the jaws has crowded the teeth together so firmly that particles of food decompose in the crevices with the formation of acids which soften the enamel. The handsome human chin, prominent and forming a decided angle, which is a measure, so called, of our determination, is the result of the more rapid shortening of the margin of the jaw bearing the teeth. The prognathous jaw of the Australian Bushman may not be a thing of beauty according to our standards of human beauty, but from the point of view of mouth hygiene, it is a consummation devoutly to be wished.

Other parts of the alimentary canal have lost their original function and to that extent have become liable to disease with all its consequences. Preeminent among useless parts of the alimentary canal is the vermiform appendix that has won an immortal fame through mortality due to inflammation of the little member. The anthropoid apes all have an appendix which is invariably longer than that of man. Its function in the human species, so far as our knowledge goes at present, is negative. In fact there are features of its embryonic development that would seem to indicate that it is simply one step in the reduction of the cæcum to which it is attached and which in like fashion is also undergoing further decrease in the human subject. The cæcum in herbivorous forms attains a large size and probably plays an important part in the digestion of the coarser parts of vegetable foods like cellulose. But in the human species, and as far as that is concerned, in the apes as well which have already begun to feed on more delicate foods including fruits and insects, this part of the alimentary canal has undergone considerable reduction. In the human subject the cavity of the cæcum is cut off completely from that of the rest of the alimentary canal in about twenty-five per cent. of the subjects examined.

On account of the relations of the appendix to the cæcum and intestine and its rudimentary character, the contents frequently stagnate and undergo decomposition so that infections are frequent which produce appendicitis.

Another portion of the alimentary canal which has lost its function to a greater or less extent is the large intestine or colon. Like the cæcum, the colon probably was originally important in completing the digestion of cellulose, which forms so large a part of the tissue of plants and which resists the action of the digestive juices. But in the human subject who, partly on account of the weakening of the teeth, does not eat cellulose in such large quantities, the colon has ceased to be an important organ of either digestion or absorption. It serves in the human largely as a reservoir for the indigestible portions of the food from which water is absorbed. The undigested food residues in the large intestine, particularly the rectum, decompose under the influence of countless bacteria which early in life find their way thither. The products of decomposition if allowed to remain in the colon are absorbed and produce the discomfort and inefficiency of constipation. Without a large intestine, no serious inconvenience follows, as shown by the cases of removal of that organ. There is one case recorded in medical literature of a French woman who lived a perfectly healthy and normal life for thirty years after the removal of the whole large intestine.

It is not only in the structure of different parts of the body that disharmonies may be found. Various functions of the body or reactions to stimuli may become perverted and work terrific damage on the individual and his progeny. It would be of great interest to analyze these disharmonies but the chapter is a long one and only one may be mentioned which has a physiological basis and which has deep significance in relation to the bacterial parasites. As is well known about one half of all the deaths are due to parasitic bacteria which gain entrance into the body and multiply and give rise to the poisons which in so many cases are fatal.

It would, however, be very misleading to leave the impression that there is no defense of the body against parasites like the pathogenic bacteria. In the course of evolution man has become protected against a large number of germs and has developed a number of defenses which stand him in good stead and without which it would be highly improbable that he could survive for long. For example, the layer of impervious, resistent, horny skin covering the whole body serves as a bulwark against the hordes of ever-present bacteria whose activities and readiness to attack are only too manifest when for any reason the integrity of the skin is broken as in a wound or surgical operation, when extreme precautions must be taken to prevent the entrance of living germs. Then, too, the respiratory tract including certain parts of the nose and the windpipe and bronchial tubes are lined with ciliated epithelium by which all particles which become embedded in the mucus secreted by intervening cells are swept outwards. Were it not for the protection thus afforded by the normal secretion of mucus and the constant sweeping of the cilia, infections of the lungs and respiratory tract would cause a far larger proportion of deaths than at present. The acid of the gastric juice also kills many bacteria which are taken into the stomach with the food and which would multiply rapidly in this otherwise ideal place for their multiplication. But the most important defenses against microbes are the so-called antibodies which are manufactured in the body and which either neutralize the poisons produced by parasitic bacteria or dissolve the germs after they gain entrance to the fluids of the body.

The human mechanism has scarcely begun to develop the antibodies which it is capable of producing, as is evidenced by the fact that man is susceptible to many diseases naturally but becomes immune under the stimulus of vaccines and viruses artificially administered, or the stimulus of an attack of the particular disease. The potentialities of the body in this direction are far beyond the actual accomplishments. What has been actually acomplished by means of the administration of antitoxin of diphtheria is indicated, for example, by the fact that mortality from this cause has been reduced from 50–60 per cent., to 12–14 per cent., by its use. Smallpox, plague, cholera, typhoid fever and a host of other diseases that have destroyed their legions, we know now can be prevented by the activity of the antibodies produced by the living human being under the stimulus of vaccines and sera. Thus a perfect immunity may be acquired under the stimulus of inoculation with anti-typhoid serum, as has been amply demonstrated in the army within the past few years. It is a matter of scientific knowledge that during the Spanish War, in 1898, every fifth man in our army of 107,000 was attacked with typhoid; but as a result of general vaccination against typhoid in the army at present, in 1916 on the Mexican border, out of 20,000 men only one man fell ill with typhoid in spite of the fact that it was prevalent in nearby towns.

This brief survey of the more obvious defects of human structure and function that put man at a striking disadvantage in contrast with some of his distant cousins who inhabit this earth ought perhaps to help us orient ourselves more perfectly in the universe. As a mechanism, man is far from perfect, but with his more perfect brain with its powers of logical reasoning and invention, he shows a capacity to adjust himself by the use of tools and other devices of his ingenuity to a rapidly changing environment, to defend himself against untoward circumstances and more than hold his own in competition with the other species of organisms on the earth to-day.